

JAPANESE

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CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART
EFFECT OF THE INVENTION TECHNICAL PROBLEM MEANS
EXAMPLE DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

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3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]The field about the key input device aiming at inputting into information machines and equipment, communication equipment, a game machine machine, etc. the instructions which control the data of a number, a character, etc., or apparatus, stopping an operation part surface product small. The field about the packaging system of the key input device which fits all of the transmission-and-reception talk by the character input by both-hands operation, and one hand operation by small information-and-telecommunications apparatus, such as a cellular phone.

[0002]

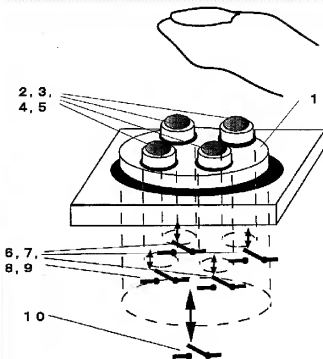
[Description of the Prior Art]Although the keyboard was generally conventionally used as an input device to information machines and equipment, in order to secure operativity, the big operation part surface product was required. Although the handwritten input method well used to a portable device could share the display and the final controlling element, input speed was slow and being accompanied by an erroneous input was a problem.While it was advantageous to ***** and a miniaturization in the physical keyboard, operativity is bad and input speed was slow in the software keyboard method which uses together the graphic keyboard displayed on a pointing device and a display. The actual condition is incompatible in the miniaturization of an input device, and the efficient input of alphabetic data also with any conventional method other than these.

[0003]

[Problem(s) to be Solved by the Invention]The key input device which makes it possible to input various number, character, and instructions highly efficiently is given stopping an operation part surface product small, And mount to small information-and-telecommunications apparatus to be able to use this key input device also [input / the input of the number, the character, and instructions by both-hands operation, and / of the transmission-and-

Drawing selection

Representative draw



[Translation done.]

reception speaker continuation by one hand operation].

[0004]

[Means for Solving the Problem]In order to solve an aforementioned problem, in a key input device of this invention. It has a panel which gives concavo-convex tactile feeling, a number, a character, instructions, etc. are beforehand assigned to a convex part and a concave part on a panel, and it opts for the number, a character, instructions, etc. to input [whether a finger position on a panel is located to which convex part or concave part]. In one gestalt of a panel, in a moving range of the thumb on a panel, a convex part and a concave part are combined and it has them 12 or more pieces. In another gestalt, in each moving range of the thumb and an index finger, a convex part and a concave part are combined and it has them six or more pieces. In the latter panel gestalt, four or more pivotable balls are arranged to a moving range of each finger, and a difference of a level difference of a ball and a trough between balls or height of balls generates a concavo-convex part.

[0005]In a method which mounts a key input device to small information-and-telecommunications apparatus, In both alter operation, such as a number, a character, instructions, etc. by both hands, and transmission-and-reception talk operation by one hand, sharing a concavo-convex panel, arrange a ball group so that a concavo-convex part of a required number may be included in a moving range of the thumb and an index finger, and. It has a mechanism in which a method of signal assignment to a concavo-convex part is changed in both-hands operation and one hand operation. If needed, some balls are made to serve a double purpose as a trackball of a pointing device, or this key input device is built into a mouse etc., and a signal selected by finger position before input decision is displayed.

[0006]

[Example]The example which applied the key input device of this invention to joy sticks, such as a game machine machine, is shown in [drawing 1](#). The four pivotable balls 2, 3, 4, and 5 are arranged on the surface of the concavo-convex panel 1. It makes it possible to move smoothly, while the ball rotated and the finger had touched the ball, and concavo-convex tactile feeling is given to a finger and a finger is derived to an objective position through a tactile sense. With the pressure added from a finger, the ball is the structure which descends with the case, and according to a finger position, one or more balls descend and it determines the combination of the switches 6, 7, and 8 and ON/OFF of nine. A device detects a finger position from the combination of this ON/OFF, the signal currently assigned to the finger position is transmitted to a display, and a display displays this signal. If strong power is furthermore added from a finger, the concavo-convex whole panel will descend and the switch 10 will be set to ON. The switch 10 plays the role of a determining key, and when this switch is set to ON, it becomes final and conclusive the signal to input based on a finger position when set to OFF.

[0007]The example which mounted the key input device of this invention in the cellular phone is shown in [drawing 2](#). The liquid crystal display screen 11 and the concavo-convex panels 12 and 13 operated with the thumb of a hand on either side are formed in the surface of the device, and each thumb moves smoothly in the two-line ball top of three rows. Are higher than the balls 14 and 15 of a center row, and the ball of others [17 / 16 and] here, and recognition of a finger position is helped, and it has prevented pushing other balls accidentally to push only the ball of a center row. The determining keys 18 and 19 operated by the index finger of a hand on either side are formed in the rear face of the device, and an input signal is become final and conclusive based on a thumb position when the determining key is

pressed. The screen of [drawing 3](#) is displayed on the display of a cellular phone, and the character currently assigned to the ball position (convex part) and the trough between balls (concave part) is shown. The character currently assigned to the convex part here is surrounded with a circle, and the character (selection character) in a thumb detection position emphasizes, and is displayed. Before pressing the determining key, the thumb can be moved and a selection character can be changed freely.

[0008]When grasping a cellular phone single hand, the thumb of the hand to grasp moves in the two-line ball top of three rows, and selects a number and instructions, and an input signal is become final and conclusive by an index finger on the back. In this case, the screen of [drawing 4](#) is displayed on a display. Although only an upside concavo-convex panel is used in one hand operation, compared with [drawing 3](#), assignment of the signal to a ball position (convex part) and the trough between balls (concave part) has changed. As a concavo-convex panel, a determining key, the antenna 20, the microphone and loudspeaker 21, and 22 grades are symmetrically arranged on a device and it is shown in [drawing 5](#), one hand operation can be carried out by any hand on either side by reversing the direction of the cellular phone at the time of grasping a cellular phone, and the direction of the display of a display.

[0009]The example which mounted the key input device 23 of this invention in the mouse 24 is shown in [drawing 6](#). The mouse button 25 has composition which serves as the role of a determining key. According to this example, the work which moves and carries out the character input of the thumb on a concavo-convex panel, and the work which carries out pointing by movement of a mouse can be done smoothly, without breaking off. Although the mouse for right-hand operation is shown in [drawing 6](#), all the alphabetical-letter kinds can be inputted by using collectively the mouse for left hands which has arranged the concavo-convex panel according to a left thumb position, or the key input device for left hands. Since it needed to change to the keyboard with the mouse, work will be interrupted by a conventional system at the time of the change of a character input and pointing, but according to this method, it has and there is no necessity for a substitute.

[0010]The method which puts the thumb and the index finger of a right-and-left hand on a concavo-convex panel, and carries out a character input to [drawing 7](#) is shown. It has the concavo-convex panels 26 and 27 which put the thumb on either side on a device, and the concavo-convex panels 28 and 29 which put an index finger on either side. Each concavo-convex panel has the same composition as [drawing 1](#). Each finger moves in the four ball top on a concavo-convex panel, and an input signal is selected [on which convex part (ball) or a concave part (between balls) a finger is].

[0011]

[Effect of the Invention]According to the above-mentioned means, in order to assign a signal to both the convex part of a concavo-convex panel, and a concave part, it becomes possible to select various signals in a small area. When the ball turning around a convex part realizes, the operator can grasp a finger position with sufficient accuracy in a small operating range by making the feel of unevenness of the ball group in contact with a finger into a key. A finger is smoothly derived to a target position on the rotating ball, and the signal to input can be selected. In the packaging system to the small information-and-telecommunications apparatus of this key input device, a concavo-convex panel can be shared by both-hands operation and one hand operation, and an efficient signal input can be performed in both operations. If needed, some balls are made to serve a double purpose as a trackball of a pointing device, or this key input device is built into a mouse etc., and it can

carry out continuously, without interrupting the work of a signal input and pointing. The signal selected by the finger position before input decision is displayed, and a finger position can be corrected, looking at a screen.

[Translation done.]